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DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on _12 November 1999_ .

2a) ☐ This action is **FINAL**.     2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) _1-16_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-6_ is/are rejected.

7) ☒ Claim(s) _7-16_ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

       1. ☐ Certified copies of the priority documents have been received.

       2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

       3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _2_ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## 1.     DETAILED ACTION

## 2.     *Claim Rejections - 35 USC § 112*

3.      The following is a quotation of the second paragraph of 35 U.S.C. 112:

4.      The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5.      Claims 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6.      Regarding claims 15 and 16, they are incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections.  See MPEP § 2172.01.  The omitted structural cooperative relationships are:  The second "generate" in the following phrase needs to be clearly linked with the object that causes generation: " ... multiplying the quadrature baseband version of the GPS L1 signal with a locally generated version of a P-code ***used to generate the Y-code component ... to generate*** a first estimate signal related to the W-code used with the P-code to generate the Y-code component; ..."

## 7.     *Claim Rejections - 35 USC § 102*

8.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

9.      A person shall be entitled to a patent unless –

10.     (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11.     Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Counselman

USPN 4809005.


12.     As per claim 1, an apparatus for tracking signals (Counselman fig. 7) comprising: a first

tracker (Counselman fig. 7: 230) for tracking a first component (Counselman fig. 11: 874) of a

first signal (Counselman fig. 7: 194) and for generating a first estimate signal (fig. 7: 228; "One

bit C/A code local model 228 is a sequence of bit values representing the C/A code specific to

GPS satellite 12. This sequence is output from C/A code generator 230 at times in accordance

with the estimated arrival time of the C/A sequence from the GPS satellite to which C/A code

generator 230 has been assigned by satellite assignment 41 from real time computer 40.") from a

second component (Counselman fig. 11: 460 is derived from 194 and thus it is a component of

194) of the first signal (Counselman fig. 11:194); a second tracker (Counselman fig. 10: 412) for

tracking a first component (Counselman fig. 10: 222) of a second signal (Counselman fig. 10:

from 220) according to the first estimate signal (Counselman fig. 10: 228 is the first estimate

signal which is used in combination with other signals derived from 222 to determine input into

412); and the second component (Counselman fig. 11: 460) of the first signal has the same

pattern (same pattern being that both inputs into the comparator are sinusoids) as the first

component (Counselman fig. 10: 222) of the second signal.


13.     As per claim 2, an apparatus according to claim 1, wherein the pattern comprises: a

known pattern (Counselman fig. 11: 458) combined with an unknown pattern (Counselman fig.

11: 194).

14.     As per claim 3, an apparatus according to claim 2, wherein timing information about the

unknown pattern is known (Counselman fig. 11: 456 is t from 36 which effectively clocks 194).

15.     As per claim 4, an apparatus according to claim 3, wherein: the first tracker (Counselman

fig. 7: 230) generates a timing signal (Counselman "This sequence is output from C/A code

generator 230 at times in accordance with the estimated arrival time of the C/A sequence from

the GPS") in accordance with the timing information (Counselman fig. 11: 456: t from 36) for

improving the accuracy of the first estimate signal (Counselman fig. 11: 228 is the first estimate

signal whose accuracy is improved because of the described processing).

16.     As per claim 5, an apparatus according to claim 2, wherein: the first tracker (Counselman

fig. 7: 230) generates a first local component signal (Counselman fig. 11: 460) in accordance

with the known pattern (Counselman fig. 7: 458) and combines the local component signal

(Counselman fig. 11: 460) with a version of the first signal (Counselman fig. 7: 194) to generate

the first estimate signal (Counselman fig. 11: 228).

17.     As per claim 6, an apparatus according to claim 2, wherein: the second tracker

(Counselman fig. 10: 412) generates a second local component signal (Counselman fig. 10: 414)

in accordance with the known pattern (Counselman fig. 11: 458 is the known pattern which is

supplied to fig. 10 in order to generate 414) and combines the second local component signal

(Counselman fig. 10: 414) with at least one version of the second signal (Counselman fig. 10:

from 220 whose version is in 418 which is combined with 414 for 200) to generate at least one

second estimate signal (Counselman fig. 10: 200).

### 18. *Allowable Subject Matter*

19.     Claims 7-14 are objected to as being dependent upon a rejected base claim, but would be

allowable if rewritten in independent form including all of the limitations of the base claim and

any intervening claims.

20.     The following is a statement of reasons for the indication of allowable subject matter:

21.     The art of record does not suggest the respective claim combinations together and nor

would the respective claim combinations be obvious with the following underlined portions:

22.     As per claim 7, an apparatus according to claim 6, wherein: the second tracker

(Counselman fig. 10: 412) ***generates a timing signal*** (not in Counselman) in accordance with the

timing information for improving the accuracy of the at least one second estimate signal.

23.     As per claim 8, an apparatus according to claim 5, wherein: the second tracker

(Counselman fig. 10: 412) ***combines the first estimate signal*** (not in Counselman) with the at

least one second estimate signal to provide a tracking signal for tracking the first component of

the second signal.

24.     Claim 9 is allowable since claim 8 is allowable.

25.     Claim 10 is allowable since claim 9 is allowable.

26.    As per claim 11, an apparatus according to claim 2, wherein: *the first signal is a GPS L1 signal; the second signal is a GPS L2 signal; the first component of the GPS L1 signal is a C/A-code component; the second component of the GPS L1 signal is a Y-code component; the first component of the GPS L2 signal is a Y-code component; the known pattern is a GPS P-code;*

27.    *the unknown pattern is a GPS W-code;*


28.    As per claim 12, a method for tracking signals comprising the steps of:

29.    locking (Counselman fig. 11: enable set) to a first component (Counselman fig. 11: 874) of a first signal (Counselman fig. 7: 194); *aligning* (not in Counselman) a local version of a second component (Counselman fig. 11: 460 is derived from 194 and thus it is a component of 194) of the first signal (Counselman fig. 11:194) with the first component (Counselman fig. 11: 874) of the first signal (Counselman fig. 7: 194); aligning a local version of a first component of a second signal with the first component of the first signal; generating a first estimate signal from a version of the first signal and the local version of the second component; applying the first estimate signal for locking to a first component of the second signal; and wherein the second component of the first signal and the first component of the second signal comprise the same pattern.


30.    As per claim 13, a method for tracking signals comprising the steps of:

31.     locking (Counselman fig. 11: enable set) to a first component (Counselman fig. 11: 874)

of a first signal (Counselman fig. 7: 194); *aligning* (not in Counselman) a local version of a

second component (Counselman fig. 11: 460 is derived from 194 and thus it is a component of

194) of the first signal (Counselman fig. 11:194) with the first component (Counselman fig. 11:

874) of the first signal (Counselman fig. 7: 194); aligning a local version of a first component of

a second signal with the first component of the first signal; generating a first estimate signal from

a version of the first signal and the local version of the second component; generating a second

estimate signal from a version of the second signal and a local version of the first component of

the second signal; combining the second estimate signal and the first estimate signal to generate

a combined estimate signal; and selectively applying either the first estimate signal or the

combined estimate signal for locking to a first component of the second signal; and

32.     wherein the second component of the first signal and the first component of the second

signal comprise the same pattern.


33.     Claim 14 is allowable since claim 13 is allowable.


34.     Claims 15 and 16 would be allowable if rewritten or amended to overcome the

rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.


35.     As per claim 15, a method of semi-codeless tracking for a GPS receiver comprising the

steps of:

36.     receiving a GPS LI signal (Counselman fig. 5) and generating at least a quadrature

baseband version of the GPS L1 signal (Counselman fig. 5: 88,90; fig. 6: 88,90); receiving a

GPS L2 signal (Counselman fig. 5,6) and generating baseband versions of the GPS L2 signal

(Counselman fig. 6: 98,100); multiplying (Counselman fig. 12: 240) the quadrature baseband

version of the GPS L1 signal (Counselman fig. 5: 88,90; fig. 6: 88,90) with a locally generated

version of a P-code (Counselman fig. 12: 204) used to generate the Y-code component

(Counselman fig. 12: 244, 247) of both the GPS L1 and L2 signals (fig. 12 applicable for both

L1 and L2) to generate a first estimate signal (Counselman fig. 12: 252, 254) related to the W-

code ***used with the P-code to generate the Y-code component*** (not in Counselman);

37.     multiplying the in-phase baseband version of the GPS L2 signal with a locally generated

version of the P-code to generate a second estimate signal related to the W-code used with the P-

code to generate the Y-code component; adding the first W-code estimate signal to the second

W-code estimate signal to generate a combined W-code estimate signal; applying the first W-

code estimate signal to generate tracking signals for tracking when the GPS receiver has not

locked to the GPS L2 signal; and applying the second W-code estimate signal to generate

tracking signals for tracking when the GPS receiver has locked to the GPS L2 signal.


38.     As per claim 16, a method of semi-codeless tracking for a GPS receiver comprising the

steps of:

39.     receiving a GPS LI signal (Counselman fig. 5) and generating at least a quadrature

baseband version of the GPS L1 signal (Counselman fig. 5: 88,90; fig. 6: 88,90); receiving a

GPS L2 signal (Counselman fig. 5,6) and generating baseband versions of the GPS L2 signal

(Counselman fig. 6: 98,100); multiplying (Counselman fig. 12: 240) the quadrature baseband version of the GPS L1 signal (Counselman fig. 5: 88,90; fig. 6: 88,90) with a locally generated version of a P-code (Counselman fig. 12: 204) used to generate the Y-code component (Counselman fig. 12: 244, 247) of both the GPS L1 and L2 signals (fig. 12 applicable for both L1 and L2) to generate a first wide-band (Counselman fig. 12: noise not removed up through this stage and thus it is wideband) estimate signal (Counselman fig. 12: 252, 254) related to the W-code **_used with the P-code to generate the Y-code component_** (not in Counselman);

40.     integrating the first wide-band estimate signal based on known timing information of the Y-code to generate a first narrow-band W-code estimate signal; multiplying the in-phase baseband version of the GPS L2 signal with a locally generated version of the P-code to generate a second wide-band estimate signal related to the W-code used with the P-code to generate the Y-code component; integrating the second wide-band estimate signal based on known timing information of the Y-code to generate a second narrow-band W-code estimate signal;

41.     adding the first narrow-band W-code estimate signal to the second narrow-band W-code estimate signal to generate a combined W-code estimate signal; applying the first narrow-band W-code estimate signal to generate tracking signals for tracking when the GPS receiver has not locked to the GPS L2 signal; and applying the second narrow-band W-code estimate signal to generate tracking signals for tracking when the GPS receiver has locked to the GPS L2 signal.

### 42.    *Conclusion*

43.    Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Pankaj Kumar whose telephone number is (703) 305-0194. The

examiner can normally be reached on Monday through Thursday after 8AM to after 6:30PM.

44.    If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chi H. Pham can be reached on (703) 305-4378. The fax phone numbers for the

organization where this application or proceeding is assigned are (703) 872-9314 for regular

communications and (703) 872-9314 for After Final communications.

45.    Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 305-3800.

46.                                                               47.

48.    PK
49.    August 7, 2002

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